

CLAIMS

What is claimed is:

1. A paper-discharging apparatus used with an image-forming device, the paper-discharging apparatus provided with a paper-discharging roller and an idle roller disposed in a paper-discharging port side of the image forming device, in which a sheet of paper is fed and discharged through the paper-discharging roller and the idle roller, the paper-discharging apparatus comprising:

a supporting plate installed at the paper-discharging port side of the image-forming device;

a supporting bracket mounted on the supporting plate to rotatably support the idle roller facing the paper-discharging roller; and

a spacing adjustment unit constantly maintaining a contact pressure between the paper-discharging roller and the idle roller.

2. The paper-discharging apparatus according to claim 1, wherein the spacing adjustment unit comprises:

an elastic member provided between the supporting plate and the supporting bracket so that opposite ends thereof abut with the supporting bracket and the supporting plate, respectively.

3. The paper-discharging apparatus according to claim 2, wherein the supporting plate and the supporting bracket are connected to be movable with respect to each other.

4. The paper-discharging apparatus according to claim 2, wherein the spacing adjustment unit further comprises:

a guide unit suppressing transverse and bending movements of the elastic member.

5. The paper-discharge apparatus according to claim 4, wherein the guide unit comprises:

at least one clamping boss protruding from one of the supporting plate and the supporting bracket such that the clamping boss is located between the supporting plate and the supporting bracket when the supporting plate and the supporting bracket are assembled.

6. The paper-discharging apparatus according to claim 5, wherein the elastic member comprises:
a coil spring installed to wrap around a circumferential surface of the clamping boss.

7. The paper-discharging apparatus according to claim 5, wherein the guide unit further comprises a hole formed on the other one of the support plate and the support bracket, and the supporting plate and the supporting bracket are connected with each other by a clamping screw inserted into the hole to be engaged with the clamping boss.

8. The paper-discharging apparatus according to claim 7, wherein the elastic member is formed longer than a projecting length of the clamping boss by a predetermined length, so that the elastic member is compressed as a spacing distance between the supporting plate and the supporting bracket is reduced when the supporting plate and the supporting bracket are assembled.

9. The paper-discharging apparatus according to claim 8, wherein the spacing adjustment unit further comprises:
another elastic member provided between the supporting plate and the supporting bracket; and
another clamping boss provided to correspond to the another elastic member.

10. A paper-discharging apparatus to discharge a sheet of paper between a paper-discharging roller and an idle roller which are disposed in a paper-discharging port side of an image-forming device, comprising:
a supporting plate formed on the paper-discharging port side thereof;
a supporting bracket having opposite ends mounted on the supporting plate, and having a middle portion, on which the idle roller is rotatably mounted to contact the paper-discharging roller, formed between the opposite ends; and
a spacing adjustment unit disposed between the supporting plate and the middle portion of the supporting bracket to adjust a distance between the supporting plate and the middle portion of the supporting bracket when an external force is exerted on one of the supporting plate and the supporting bracket.

11. The paper-discharging apparatus according to claim 10, wherein the spacing adjustment unit controls the support bracket to maintain a contact pressure generated between the paper-discharging roller and the idle roller constant while adjusting the distance between the supporting plate and the middle portion of the supporting bracket.

12. The paper-discharging apparatus according to claim 10, wherein the middle portion of the supporting bracket is spaced-apart from the supporting plate by the distance in a direction perpendicular to the paper disposed between the paper-discharging roller and the idle roller.

13. The paper-discharging apparatus according to claim 10, wherein the supporting plate moves toward the supporting bracket while another distance between the middle portion of the supporting bracket and the paper-discharging roller is maintained constant.

14. The paper-discharging apparatus according to claim 10, wherein the spacing adjustment unit comprises:

an elastic member disposed between the supporting plate and the middle portion of the supporting bracket to elastically adjust the distance between the supporting plate and the middle portion of the supporting bracket.

15. The paper-discharging apparatus according to claim 10, wherein the spacing adjustment unit comprises:

a plurality of elastic members disposed between the supporting plate and the middle portion of the supporting bracket to elastically adjust the distance between the supporting plate and the middle portion of the supporting bracket.

16. The paper-discharging apparatus according to claim 15, wherein the elastic members are disposed between the opposite ends of the supporting bracket at a predetermined interval.

17. The paper-discharging apparatus according to claim 16, wherein the elastic members have different elasticity.

18. The paper-discharging apparatus according to claim 10, wherein the supporting plate elastically moves toward the support bracket according to elasticity of the elastic member while a distance between the paper-discharging roller and the idle roller is maintained constant.

19. A paper-discharging apparatus to discharge a sheet of paper between a plurality of paper-discharging rollers and a plurality of idle rollers, which are rotated by corresponding ones of the paper-discharging rollers in an image-forming device, the paper-discharging apparatus comprising:

- a supporting plate formed on the paper-discharging port side thereof;

- a supporting bracket having opposite ends mounted on the supporting plate, and having a middle portion, on which the idle rollers are rotatably mounted to contact corresponding ones of the paper-discharging rollers, formed between the opposite ends; and

- a spacing adjustment unit disposed between the supporting plate and the middle portion of the supporting bracket to maintain a contact pressure generated between corresponding ones of the paper-discharging rollers and the idle rollers regardless of an external force exerted on one of the supporting plate and the supporting bracket.

20. The paper-discharging apparatus according to claim 19, wherein a distance between the supporting plate and the middle portion of the supporting bracket varies according to the spacing adjustment unit while the contact pressure is maintained constant.

21. The paper-discharging apparatus according to claim 19, wherein the middle portion of the supporting bracket is spaced-apart from the supporting plate by a distance which varies according to deformation of the supporting plate.

22. The paper-discharging apparatus according to claim 19, wherein a distance between the middle portion of the supporting bracket and the paper-discharging rollers is maintained constant.

23. The paper-discharging apparatus according to claim 19, wherein the middle portion of the supporting bracket is not deformed in a direction perpendicular to a center passing through the paper-discharging rollers while the supporting plate is elastically deformed.

24. A paper-discharging apparatus to discharge paper from an image forming device having discharging rollers, comprising:

a supporting plate positioned at a paper-discharging port side of the image forming device; and

a supporting bracket including idle rollers facing the paper-discharging rollers, flexibly mounted to the support plate to maintain a constant contact pressure between the idle rollers and respective paper-discharging rollers.

25. The paper-discharging apparatus according to claim 24, wherein the supporting plate has a supporting plate axis disposed substantially parallel to at least one of a first center axis of the idle rollers of the supporting bracket and a second center axis of the discharging rollers, and the supporting plate axis of the supporting plate becomes disposed not to be parallel to the at least one of the first center axis and the second center axis according to a force exerted on one of the supporting plate and the supporting bracket while the first center axis and the second center axis are maintained substantially parallel to each other.